RESTRICTED CIRCULATION

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Agricultural Memorandum No 578

Incidence of ticks in south-west England - L P Smith

Previous work by J Donnelly and J C MacKellar had shown the dependence of the incidence of red-water fever, transmitted by a tick, on day maximum temperatures.

Data are available in terms of "spring totals" and "autumn totals" and the present analysis examines the influence exerted by totals in the preceding season, using Newton Abbot mean monthly maxima.

Effect of Spring Total on Autumn Total

Total correlations	Autumn Total on Spring Total	+ 0.2480
	on June & July max	+ 0.5172
	Spring Total on June & July max	- 0.3754

giving partial correlations

+ 0.68 for Autumn Total on max temp
+ 0.56 on spring total

with a regression

$$\text{Autumn Total} = 29.25\ T_1 + 0.75S - 1014$$

where T_1 = sum of mean monthly max. June and July
S = spring total

Effect of Autumn Total on following Spring Total

Total correlations	Spring Total on Autumn Total	+ 0.4342
	on May max	+ 0.4584
	Autumn Total on May max	- 0.3518

giving partial correlations

+ 0.73 for Spring Total on max temp
+ 0.72 on Autumn Total

with a regression

$$\text{Spring Total} = 32\ T_2 + 0.5A - 434$$

where T_2 = mean monthly max in May
A = autumn total

It is therefore possible, starting with the spring total of 1955, and using only meteorological data for May, June and July to estimate the subsequent tick counts.

FH1

	Spring Totals		Autumn Totals	
	Act	Est	Act	Est
1955	197	-	332	336
1956	316	300	321	331
1957	240	231	438	390
1958	216	241	260	264
1959	189	245	329	387
1960	295	303	324	392
1961	216	277	461	387
1962	230	201	341	243
1963	234	167	323	220
1964	274	198	329	281
1965	270	189	207	201
1966	152	159	240	269
1967	152	174	191	286

The correlation between actual and estimated is 0.73.

Any comments or suggestions on this paper should be referred to the author.

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Bracknell

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